



Dryden Flight Research Center
Edwards, California 93523-0273

DOP-Y-003
Revision: D

DRYDEN ORGANIZATIONAL PROCEDURE

CODE Y

MISSION DEVELOPMENT AND IMPLEMENTATION

Electronically Approved by:
Director, Airborne Science

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DOCUMENT HISTORY PAGE

This page is for informational purposes and does not need to be retained with the document.

DATE APPROVED	ISSUE	PAGE	AMENDMENT DETAILS
2-10-99	Baseline		
3-11-99	Revision A	All	Modified order of Sec.4, added Sec. 6 and changed wording in 2.0,3.2,3.5.6,4.1.2,5.1.2, and 5.2.2
4/17/99	Revision B	1,2,5,7,8	Renumbered existing Sec. 6 to 8, added new Sec. 6 and 7, updated Sec. 2 and reworded Sec. 4.2.6 and 3.5 Modified this Document History Page
8/3/99	Revision C	5	Insert new paragraph after 3.5.2 & renumber subsequent paragraphs. Minor grammatical corrections made throughout.
See IDMS Document Master List	Revision D	2, 3, 6, 7, 8, & 9	Insert new paragraph 3 & renumber subsequent paragraphs. Reworded paragraphs 1, 4.1, 4.2, 4.4.3, 4.4.5.1, 4.5. 4.5.3, 4.5.6, 4.5.11, 5, 5.1, 5.1.4, 5.1.6, 5.2, 5.2.4, 5.2.7, 5.2.9, & 7.7. Changed references to Technical Management Specialist (TMS) to Program Control Officer (PCO). Deleted form Y-001a, Weekly Airborne Science Authorization (ER-2) and updated title to form Y-002.

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1.0 PURPOSE

This procedure establishes the process for mission development and implementation and the responsibilities of individuals involved (Mission Managers, the Program Manager, and the Directorate office).

2.0 APPLICABLE DOCUMENTS

DCP-X-008, Tech Brief and Mini-Tech Brief
DCP-X-009, Airworthiness and Flight Safety Review
DCP-X-020, Operational Readiness Review
DOP-Y-006, Airborne Science Configuration Control
DOP-Y-007, Airborne Science Configuration Control Board Process
DHB-Y-001, Airborne Science Handbook

3.0 GENERAL POLICIES

- 3.1 The format for all Airborne Science correspondence, records, and presentations will be consistent whenever practical (i.e. diplomatic clearances, questionnaires, Tech Briefs, and operational readiness reviews).
- 3.2 The Directorate office is responsible for overall Airborne Science platform scheduling, mission assignments, and committing resources. The Directorate's current year and 5-year schedules are considered master schedules and all other schedules should be consistent with those.
- 3.3 The Directorate office has the sole responsibility for communications at the directorate level and above regarding Airborne Science policies, resources, schedules, and concerns/issues.
- 3.4 Mission Managers are responsible for assigned campaign/mission implementation and success and therefore are the campaign/mission's communications focal point during missions. As the focal point, the Mission Manager will be the official source for mission related information.

4.0 MISSION DEVELOPMENT

4.1 Information Assembly

Upon assignment, the Program Manager provides the Mission Manager with approved flight requests and schedule parameters, if available, for mission development and implementation. Flight requests and other documents are studied to gather information regarding the mission. This information can include

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the science goals, instruments needed, and any programmatic issues. Gather all information available on proposed program and instruments. Start with the flight requests and follow up with Principal Investigators (PI) interviews.

4.1.1 Mission Participants

From the flight requests and other documents, develop a list of principal investigators, their addresses and phone numbers. Verify these contact points to check affiliation, relation to project, office and shipping addresses, fax, phone, and E-mail. Get names of technicians, crew, and others that will participate in the mission.

4.1.2 Flight Hours & Mission Location

Information from the Program Control Officer (PCO) is used to gather the approved flight hours and locations for the mission.

4.1.3 Dates

The flight requests are used to establish the dates of the mission. Any special conditions associated with the flight requests including time of year, time of day, or weather constraints need to be considered.

4.1.4 Flight Requirements

Gather the geographic locations and profiles needed for the mission from the flight request and the principal investigators. This is passed to the Operations flight crew contact for concurrence and/or modifications. Note whether proposed flight paths require penetration of any foreign, congested, or restricted airspace. International clearances must be arranged for flight in foreign airspace, with or without data, as well as landing at and operating from a foreign base.

4.2 Mission Schedule

A mission schedule is prepared in accordance with the Mission Manager checklist (contained in Airborne Science Handbook). Mission Managers will plan their missions within the schedule parameters (par. 3.2) set by the Directorate office. Any requirements/requests that exceed those parameters must be coordinated and approved by the Directorate office. This schedule will take into account any necessary lead times for fabrication, integration, crew restrictions, or international clearance requirements.

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4.3 Meetings

Science meetings regarding the mission should be attended when possible to keep informed of the science requirements, payload, and contingencies that arise. Missions that require any interagency or aircraft coordination meetings need to be attended.

4.4 Site Survey and Logistics Support

- 4.4.1 A site survey is conducted to determine the suitability of a proposed airfield for deployed operations with the proposed aircraft. Logistics support is a major factor. Deployments to a fixed base of operations usually require experimenter team work space, electric power for instruments and test equipment, tables, chairs, telephones, lighting, and vehicles. The point-of-contact at the deployment site must be involved early in the planning stage to ensure that the desired support will be available.
- 4.4.2 A preliminary site survey should be conducted where a location has not been used previously or the site has been modified extensively. The survey team normally includes representatives from the platform contractor, flight operations, the science community, Airborne Science management, and the Mission Manager.
- 4.4.3 If not accomplished by a Program Office, the team will prepare a site survey report and present the recommendation to Airborne Science management for selection.
- 4.4.4 A follow-up site survey is used to update information on selected sites used previously or to get additional information after a preliminary site survey. Several follow-up surveys may be required. The follow-up site survey team usually is comprised of technical specialists in areas such as logistics support, operations, contracts, and any other special areas, depending on the location and identified needs. The survey may be conducted in person or by telephone.
- 4.4.5 Site Requirements
 - 4.4.5.1 The Mission Manager must verify airfield support availability, to include but not limited to, fuel, power carts, hangar space, heaters and coolers, aircraft servicing (sewage disposal where applicable), work stands, and flight operations support. If cryogen and gasses

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necessary to support the flight are not available, provisions must be made to preposition the items.

4.4.5.2 The Mission Manager must address personnel logistics requirements and satisfaction, to include passports, visas, security issues, hotel accommodations, transportation, and flight meals where applicable.

4.4.6 Prior to deployment, briefings concerning factors that could adversely affect personnel or operations should be given to all deployment personnel. Briefings by local authorities at the deployment site should be conducted and cover the same topics. Subjects should include local dangers such as insects, animals, safe areas, weather conditions, water potability, and vaccinations required.

5.0 MISSION SCHEDULE PREPARATION AND COORDINATION

Information gathered on the proposed mission or campaign is used to construct a draft mission schedule. Additional information is needed, as the campaign becomes mature. The Mission Manager will accomplish the following as necessary.

- 5.1 Identify hazards using the Experimenter's Questionnaire, and other means, and timely distribute the information to concerned parties.
- 5.2 Verify instrument requirements such as probes, sensors, antennas, lasers, rack sizes and types, storage boxes, windows, and power needs using the Experimenter's Questionnaire, and other means, and timely distribute. Generate work requests IAW contractors' processes. Route through directorate management for approval.
- 5.3 If needed, lead an Experiment Conformance Review and ensure an Experiment Conformance Report is written. The review will assess whether the experiment meets the requirements stated in the Experimenter's Integration Manual. Participants should include representatives from Operations, the platform contractor, and the Airborne Science Facility Operations Manager.

5.3.1 Estimate experiment integration time. Consider off-aircraft facility requirements for data processing, equipment maintenance, and fabrication lead times. Include window tests and laser calibrations.

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- 5.3.2 Estimate the number of instrument checkout and calibration flights required.
- 5.3.3 Prepare a comprehensive mission (campaign) schedule. The Mission Manager's checklist provides detailed guidance on items to be considered. When feasible, avoid scheduling that requires weekend travel for contractors.
- 5.3.4 Generate Configuration Change Request IAW DOP-Y-006.
- 5.3.5 Lead the construction of the presentation for the Airworthiness and Flight Safety Review Board review of experiments and aircraft modifications in accordance with DCP-X-009 (if required). This should be accomplished as early as possible in the program.
- 5.3.6 Lead the presentation to Configuration Control Boards held for his/her assigned mission IAW DOP-Y-007.
- 5.3.7 Lead the presentation to any Operational Readiness Review as required by DCP-X-020.
- 5.3.8 Lead the presentation of material to the Technical Brief audience in accordance with DCP-X-008 and ensure Form Y-002 is signed.
- 5.3.9 Verify that all site support and personnel logistics items are in order for deployments.

6.0 COST ESTIMATES

In general HQ NASA provides the funding for aircraft flying time and government employee salaries supporting HQ directed missions. All other costs incurred during preparation or execution of the mission are charged against the flight request (Principal Investigator/Discipline Manager). Examples of such cost are: cost of site surveys, aircraft ground support, engineering, logistics support, contractor travel and overtime, materials, and fuel cost for any charges in excess of the government rate. These are called "Mission Peculiar Costs" (MPC).

- 6.1 Gather cost information to determine MPC.
- 6.2 Develop preliminary cost estimates and provide Resource Analyst with estimates. The Resource Analyst provides the estimate to the Directorate Office.

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6.3 Track and update MPCs.

6.4 MPC estimates will be reviewed and released from the Directorate office.

7.0 MISSION IMPLEMENTATION

Airborne Science management is the approving authority for all Airborne Science platform flights. This policy is dictated by the impact that can result on Airborne Science commitments and resources. Science mission flights, including functional check and pilot proficiency that directly support science missions, are approved by the assigned Mission Manager. The Mission Manager that has that platform's next assigned mission may approve program flights that are not a direct part of a science mission. If a Mission Manager is not available or assigned the Directorate office can approve non-science mission related flights. Proposed flight schedules will be briefed by the assigned Mission Manager at the weekly Airborne Science status meeting.

7.1 ER-2 Mission Implementation. Mission Managers will:

7.1.1 Brief affected parties of experiment hazards.

7.1.2 Notify the experimenter of any experiment that is damaged, lost or unsuitable for installation.

7.1.3 Participate in the science team meetings to determine science mission requirements.

7.1.4 Conduct mission planning meetings to review and approve the proposed flight. The Mission Manager will document approval using form Y-001.

7.1.5 Conduct a mission debrief after any flight.

7.1.6 Prepare and distribute a status report (DFRC 137) giving cursory information about the flight, to include mission results, aircraft status.

7.2 DC-8 Mission Implementation. Mission Managers will perform the following duties as the DC-8 Mission Director:

7.2.1 Brief affected parties on experiment hazards.

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- 7.2.2 Notify the experimenter of any experiment that is damaged, lost or unsuitable for installation.
- 7.2.3 Participate in the science team meetings to determine science mission requirements.
- 7.2.4 Conduct mission planning meetings to review and approve the proposed flight. The Mission Manager will document approval, using form Y-011.
- 7.2.5 Develop the experimenter manifest and give it to the pilot-in-command or his/her representative.
- 7.2.6 Ensure that flight participation forms and crew safety briefings for experimenters are accomplished.
- 7.2.7 Operate the Mission Director's console as required during the mission.

7.3 Conduct a mission debrief after any flight.

7.4 Prepare and distribute a status report (DFRC 137) giving cursory information about the flight, to include mission results, aircraft status.

8.0 CLOSE OUT ACTIVITIES

8.1 Local Area Missions

8.1.1 Allocate flight hours to specific flight request(s) and provide to the PCO.

8.1.2 Verify the actual MPCs with the Resource Analyst.

8.2 Deployed Missions

8.2.1 Allocate flight hours to specific flight request(s) and provide to the PCO.

8.2.2 Verify the actual MPCs with the Resource Analyst.

8.2.3 Accomplish a mission summary of mission highlights and recommendations.

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9.0 MISSION RECORDS

An Airborne Science Directorate Technical Documentation Specialist (TDS) will maintain a mission records file that will contain items pertinent to each mission. The Mission Manager is responsible for supplying documents to the TDS. The file will contain, as a minimum, the following records (if applicable):

- 9.1 Site survey correspondence and report (deployment only)
- 9.2 Chief Engineer correspondence
- 9.3 Instrument layout/floor plan (cartoons)
- 9.4 Configuration Control Board presentations and minutes
- 9.5 Fly-Away Kit listings (deployment only)
- 9.6 Flight Requests
- 9.7 Technical Briefing with signed Form Y-002
- 9.8 Operational Readiness Review (deployment only)
- 9.9 Experimenter Safety Briefing roster (with signatures)
- 9.10 Schedules (e.g. mission, logistics, and personnel)
- 9.11 Notification of damaged customer supplied equipment
- 9.12 Flight authorizations
- 9.13 Flight reports
- 9.14 Mission summary report

10.0 FORMS

- DFRC 137, Airborne Science Flight Report
- Y-010 Airborne Science Flight Participation
- Y-011 Airborne Science Flight Itinerary and Passenger Manifest
- Y-002 Airborne Science Tech Brief Flight Request
- Y-001 Airborne Science Flight Authorization (ER-2)

11.0 OFFICE OF PRIMARY RESPONSIBILITY (OPR)

OPR for this document is the Program Manager.